

AMENDMENTS TO THE CLAIMS

1.(currently amended): An FIR filter comprising:

a first operational unit for operating input data which including a first input data and a second input data inputted after the first input data, said input data consists of transmitting information and is composed of bit strings, and additional data which is added in order to transmit said input data and;

a second operational unit for operating previous data among said on the first input data and a difference between said additional data corresponding to the previous first input data and said additional data corresponding to present data among said the second input data; and

an adding unit for adding results of the first and second operational units operations and outputting the resultant as a filter response.

2. (original) The FIR filter according to claim 1, further comprising

a data separation unit for separating data inputted to the filter into said input data and said additional data.

3.(currently amended): The FIR filter according to claim 1, further comprising:

a shift register for receiving said input data in sequence; and
factor multipliers for multiplying outputs from each of delay elements of said shift register by tap factors, and wherein:

said first operational unit includes a first adder tree for adding outputs from said factor multipliers and a first multiplier for multiplying an output from said first adder tree by said additional data;

said second operational unit includes a second adder tree for adding said previous first input data among said outputs from said factor multipliers and a second multiplier for multiplying an output from said second adder tree by said difference; and

said adding unit adds an output from said first multiplier and an output from said second multiplier.

4.(currently amended): The FIR filter according to claim 3, further comprising switches for connecting outputs of said factor multipliers to said second adder tree, wherein

said switches are switched on and off in response to a shift operation of said input data in said shift register and transmit said previous first input data to said second adder tree.

5. (original) The FIR filter according to claim 4, wherein
said switches are switched off in response to every shift operation of said shift register, the switching-off being performed in sequence, starting from a switch corresponding to one of said factor multipliers at an input side.

6.(currently amended): The FIR filter according to claim 3, further comprising switches for connecting said second adder tree to one of an output of a predetermined one of said factor multipliers and an output of a predetermined one of adders which compose said first adder tree, wherein

said switches are switched on and off in response to a shift operation of said input data in said shift register and transmit said previous first input data to said second adder tree.

7.(currently amended): The FIR filter according to claim 1, further comprising:
a holding circuit for accepting said additional data in response to a change in said input data and holding the accepted data as said additional data corresponding to said ~~previous~~ ~~first input~~ data; and

an operational circuit for operating a difference between said additional data outputted from said holding circuit and new additional data.

8.(currently amended): An FIR filter comprising:
a first operational unit for operating ~~present~~ on a second input data inputted after a ~~first~~ input data among input data which includes the first input data and the second input data and consists of transmitting information and is composed of bit strings, and additional data which is added in order to transmit ~~said present~~ the second input data;

a second operational unit for operating ~~previous~~ data among said on the first input data and said additional data corresponding to said ~~previous~~ first input data; and

an adding unit for adding results of the first and second operational units operations and outputting the resultant as a filter response.

9. (original) The FIR filter according to claim 8, further comprising
a data separation unit for separating data inputted to the filter into said input data and said additional data.

10. (original) The FIR filter according to claim 8, further comprising:

a shift register for receiving said input data in sequence;
factor multipliers for multiplying outputs from each of delay elements of said shift register by tap factors; and
switches being switched on and off in response to a shift operation of said input data in said shift register, for transmitting outputs from said factor multipliers to one of said first operational unit and said second operational unit.

11. (Withdrawn- currently amended): An FIR filter comprising:

a first operational unit for adding ~~present~~ a second input data inputted after a first input data among input data which includes the first input data and the second input data,
consists of transmitting information and is composed of bit strings;

a second operational unit for operating ~~previous data among said the first~~ input data and a ratio of said additional data corresponding to said previous first input data to said additional data corresponding to said present second input data;

an adding unit for adding an output from said first operational unit and an output from said second operational unit; and

a multiplying unit for multiplying an output from said adding unit by said additional data corresponding to said present second input data and for outputting the resultant as a filter response.

12. (Withdrawn) The FIR filter according to claim 11, further comprising

a data separation unit for separating data inputted to the filter into said input data and said additional data.

13. (Withdrawn) The FIR filter according to claim 11, further comprising:

a shift register for receiving said input data in sequence;

factor multipliers for multiplying outputs from each of delay elements of said shift register by tap factors; and

switches being switched on and off in response to a shift operation of said input data in said shift register, for transmitting outputs from said factor multipliers to one of said first operational unit and said second operational unit.

14.(Withdrawn- currently amended): The FIR filter according to claim 11, further comprising:

a holding circuit for accepting said additional data in response to a change in said input data and holding the accepted data as said additional data corresponding to said previous first input data; and

an operational circuit for operating a ratio of said additional data outputted from said holding circuit to new additional data.

15.(currently amended): A method of operating an FIR filter, comprising the steps of: receiving in sequence input data which includes a first input data and a second input data inputted after the first input data, said input data consists of transmitting information and is composed of bit strings;

operating said input data and additional data which is added in order to transmit said input data;

operating ~~previous data among said the first~~ input data and a difference between said additional data corresponding to said ~~previous first~~ input data and said additional data corresponding to ~~present the second~~ input data; and
adding results of said operations and outputting the resultant as a filter response.

16.(currently amended): A method of operating an FIR filter, comprising the steps of:

receiving in sequence input data which includes a first input data and a second input data inputted after the first input data, said input data consists of transmitting information and is composed of bit strings;

operating ~~present data among said the second~~ input data and additional data which is added in order to transmit said ~~present second~~ input data;

operating ~~previous data among said the first~~ input data and said additional data corresponding to said ~~previous first~~ input data; and

adding results of said operations and outputting the resultant as a filter response.

17.(Withdrawn- currently amended): A method of operating an FIR filter, comprising the steps of:

receiving in sequence input data which includes a first input data and a second input data inputted after the first input data, said input data consists of transmitting information and is composed of bit strings and;

adding ~~present data among said the second~~ input data;

operating ~~previous data among said the first~~ input data and a ratio of said additional data corresponding to said ~~previous~~ first input data to said additional data corresponding to said ~~present~~ second input data;

adding results of said operations;

multiplying the addition result by said additional data corresponding to said ~~present~~ second input data; and

outputting the multiplication result as a filter response.

18.(currently amended): A semiconductor integrated circuit including an FIR filter, wherein

the FIR filter comprises:

a first operational unit for operating input data which includes a first input data and a second input data inputted after the first input data, said input data consists of transmitting information and is composed of bit strings, and additional data which is added in order to transmit said input data;

a second operational unit for operating ~~previous data among said the first~~ input data and a difference between said additional data corresponding to the ~~previous~~ first input data and said additional data corresponding to ~~present data among said the second~~ input data; and

an adding unit for adding results of the first and second operations and outputting the resultant as a filter response.

19.(currently amended): A semiconductor integrated circuit including an FIR filter, wherein

the FIR filter comprises:

a first operational unit for operating ~~present a second input data inputted after a first input~~ data among input data which includes the first input data and the second input data, said input data consists of transmitting information and is composed of bit strings, and additional data which is added in order to transmit said ~~present second input~~ data;

a second operational unit for operating ~~previous data among said the first input~~ data and said additional data corresponding to said ~~previous first input~~ data; and

an adding unit for adding results of the first and second operations and outputting the resultant as a filter response.

20. (Withdrawn- currently amended): A semiconductor integrated circuit including an FIR filter, wherein

the FIR filter comprises:

a first operational unit for adding additional data corresponding to ~~present a second input data inputted after a first input data~~ among input data which includes the first input data and the second input data, said input data consists of transmitting information and is composed of bit strings;

a second operational unit for operating ~~previous data among said the first input~~ data and a ratio of said additional data corresponding to said ~~previous first input~~ data to said additional data corresponding to said ~~present second input~~ data;

an adding unit for adding an output from said first operational unit and an output

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a multiplying unit for multiplying an output from said adding unit by said additional data corresponding to said ~~present~~ second input data and for outputting the resultant as a filter response.

21.(currently amended): A communication system for transmitting data filtered by an FIR filter, the communication system comprising:

a first operational unit for operating input data which includes a first input data and a second input data inputted after the first input data, said input data consists of transmitting information and is composed of bit strings, and additional data which is added in order to transmit said input data;

a second operational unit for operating ~~previous data among said the first input~~ data and a difference between said additional data corresponding to the ~~previous~~ first input data and said additional data corresponding to ~~present data among said the second input data~~; and

an adding unit for adding results of the first and second operations and outputting the resultant as a filter response.

22.(currently amended): A communication system for transmitting data filtered by an FIR filter, the communication system comprising:

a first operational unit for operating ~~present~~ a second data inputted after a first input data among input data which includes the first input data and the second input data, said input data consists of transmitting information and is composed of bit strings, and additional data which is added in order to transmit said ~~present~~ second input data;

a second operational unit for operating ~~previous~~ the first input data among said input data and said additional data corresponding to said ~~previous~~ first input data; and

an adding unit for adding results of said first and second operations and outputting the resultant as a filter response.

23.(Withdrawn- currently amended): A communication system for transmitting data filtered by an FIR filter, the communication system comprising:

a first operational unit for adding ~~present~~ a second data inputted after a first input data among input data which includes the first input data and the second input data, said input data consists of transmitting information and is composed of bit strings;

a second operational unit for operating ~~previous~~ data among said the first input data and a ratio of said additional data corresponding to said ~~previous~~ first input data to said additional data corresponding to said ~~present~~ second input data;

an adding unit for adding an output from said first operational unit and an output from said second operational unit; and

a multiplying unit for multiplying an output from said adding unit by said additional data corresponding to said ~~present~~ second input data and for outputting the resultant as a filter response.